

Claims 1-12 are pending in the subject application. Claims 9-12 were withdrawn from consideration. Claims 1-8 and 13-16 stand rejected under 35 U.S.C. §102, 35 U.S.C. §103 and/ or 35 U.S.C. §112, second paragraph.

Claim 1 was amended for clarity and to more distinctly claim the present invention. Claim 17 was added to claim the embodiments as set forth in claims 13-16 in combination with the language of un-amended claim 1. As discussed below in connection with the prior art based rejections of claims 13-16, Applicant believes that claims 13-16 are patentable separate and apart from the amendment herein to pending claim 1. Thus, Applicant has added independent claim 17 in the foregoing amendment.

Included herewith is a marked-up version of the amendments to the subject application by the current amendment. The marked-up versions are found on the pages captioned or entitled "Details of Amendments" that follow the signature page of the within Response.

35 U.S.C. §112 REJECTIONS

Claims 13-14 and 16 stand rejected under 35 U.S.C. §112 on the grounds that these claims are indefinite, lack antecedent basis and/ or are vague. More particularly, these claims stand rejected because the phrase "a long axis of the support member" is considered vague and indefinite because it does not properly define the recited axis. Also it is noted that only one axis is recited as belonging to plural support members, which makes it unclear as to which axis is being referred to. Applicant respectfully traverses.

The term axis has a number of meanings not all of which involve an axis of rotation. One meaning given refers to the straight line, real or imaginary, passing through a body, on which the body revolves, or may be imagined to revolve, for example the axis of the earth. Another meaning given in the area of mechanics refers to the support for any rotating body. Yet another meaning given, in the area of geometry refers to (a) the imaginary line passing through the center of a plane or solid; the central line with reference to which the parts are symmetrically arranged; (b) any straight line for measurement or reference as in a graph.

In the present invention, and with reference to the coordinate axes illustrated on FIGS 2-3 of the subject application, it is clear that one direction of the support pins 23, 24 is the direction Y (e.g., see also discussion at pages 10-11 of the subject application).

It is clear from the subject application and the drawing figures, that the axis such motion is occurring with respect to corresponds to the Z axis (not shown). It also is clear that the Z-axis also would correspond to the straight line or axis that extends along the longest dimension of the support pin. Applicant would note that it is not a uncommon practice, nor is it inconsistent with any usual meaning given to the term axis, to refer to the straight line or axis that extends along the longest dimension of a solid or an object, for example a cylindrical object such as pin, as the long axis of that object or cylinder.

As to the assertion that one axis is referred to for multiple support members (which is assumed to apply to only claims 13 and 14), the phrase in question was intended to indicate that each of the support members was moving in the same direction with respect to the long axis for each of, and all of, the support members. For

example, and as illustrated in FIG. 2, each of the support members/ support pins move in the same direction towards or away from the shaft member (i.e., in direction Y).

Stated another way, the support members move in one direction with respect to a plane that is defined by the long axis of all the support members.

As provided in MPEP-2173.05(a), "[i]f the claims, read in light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is precise as the subject matter permits, the statute (35 U.S.C. 112, second paragraph) demands no more..." (citations omitted). Also, MPEP-2173.04 provides that breadth of a claim is not to be equated with indefiniteness (citations omitted). It is clear from the foregoing remarks that one skilled in the art would, upon reading the claims in light of the specification, understand and be apprised of the scope of the invention and its utilization.

It is respectfully submitted that for the foregoing reasons, claims 13-14 and 16 satisfy the requirements of 35 U.S.C. §112 and, as such, these claims are allowable.

35 U.S.C. §102 & §103 REJECTIONS

Claims 1-8 and 12-16 stand rejected under 35 U.S.C. §103(b) as being anticipated by or, in the alternative, under 35 §103 as being unpatentable over Mears et al. [USP 5,040,484; "Mears"]. Applicant respectfully traverses as discussed below. Because claim 1 was amended in the foregoing amendment, the following discussion refers to the language of the amended claim. However, only those amended features specifically relied upon to distinguish the claimed invention from the cited prior art

shall be considered as being made to overcome the cited reference. The following separately addresses the rejection as to group(s) of claims.

CLAIMS 1, 3-8 & 13-16

Applicant claims, claim 1, a mechanism for supporting a substrate to be coated with a film, which mechanism is used in a film forming apparatus. The mechanism includes a stage, a shaft member, a plurality of support members and a moving means for moving the support members. The stage receives the substrate that has been transported into the film forming apparatus to form a film on the substrate. The shaft member angularly displaces that stage that is bearing the substrate, from the substrate receiving position at which the stage received the substrate, to a film forming position at which a substrate bearing surface of the stage is vertical or substantially vertical. The plurality of support members are provided so as to protrude from the substrate bearing surface of the stage and so as to support one end surface of the substrate, where said one end surface is the surface of the substrate that faces downwards when the stage is angularly displaced to the film forming position.

As indicated in the subject application (e.g., p. 3 thereof), because the support members of the present invention are movable, peeling-off of the thin film which has been formed on the substrate surface, as well as the cracks and the chips in the substrate coated with the thin film, can be almost completely prevented by moving the support members before transporting the substrate out of the film forming apparatus after formation of the film. Applicant notes that the problem described in the subject application is nowhere described or suggested in Mears and that solution to this

problem also is nowhere described or suggested in Mears. As indicated previously this is not surprising, because as discussed hereinafter Mears describe a method and apparatus for clamping a semiconductor wafer, which method and apparatus nowhere describes, teaches, or suggests the supporting mechanism as set forth in claim 1.

Mears describes a mechanism for retaining a multiplicity of wafers disposed in a rotating disc (2). As described therein, a wafer is conveyed to a selected platen on the disc and this means for transferring is located in a transfer chamber. It also is described, with reference to figures 5-8 thereof, that a multiplicity of fingers extend slightly above the flat surface of each platen, which fingers retain the wafer. As further described, an actuation mechanism causes these fingers to be moved inward radially so as to *clamp* the wafer there between. Correspondingly, the actuation mechanism causes the fingers to be moved outward radially so as to release or unclamp the wafer, so it can be removed from the platen. Such removal is effected by raising the wafer above the surface of the platen allowing the wafer to be transferred elsewhere in the transfer chamber.

In sum, Mears describes a method and apparatus in which opposing fingers or members are moved towards each other to clamp and moved away from each other to release or unclamp the wafer. Consequently, the structural arrangement of these fingers or members is completely different from that of the supporting mechanism as set forth in claim 1 of the subject application. As set forth in claim 1, the support members support one end surface of the substrate, where this end surface is the surface that faces downwards when the stage is angularly displaced to the film forming position.

In addition to not describing the problem or the solution of the present invention, the clamps, fingers or support members in Mears would not prevent peeling, chipping, or cracking of the thin film formed on the wafer. These fingers angle towards the wafer and make significant contact with the wafer surface as well as increasing the surface area of the fingers available for the thin film to be coated on.

Also, because the fingers that make up the clamp in Mears are bent towards the wafer, it is impossible to relax a stress of the formed thin film. Accordingly, when the stress is released during the unclamping process in Mears, there is a possibility that the wafer would be vibrated so as to generate dust. Further, due to the stress, there also is a possibility that a crack or chip would form or appear in the thin film that is formed on the wafer.

The support members of Mears are actually "machined to conform to the shape of the edge of the workpiece ... they form portions of a circle to match the circumference of the circular wafer." (US 5,040,484 column 5, lines 2-7). Thus, and as also indicated above, the support members in Mears are designed to have a significant amount of contact with the wafer.

In addition, it should be recognized that in Mears there are plurality or more of wafers that are being secured to the disc as the disc is being rotated from a horizontal to a vertical position. Also, once this disc is rotated into the vertical position it is further rotated about a central axis for processing of the wafers. As such, it is not physically possible for a wafer in Mears to be only supported from one end surface of the wafer. If the wafers were so supported, the wafers would fall off as the disc is

rotated from the horizontal to the vertical position as well as when the disc is being rotated about the central axis during processing.

In sum, Mears does not disclose, either expressly or inherently, each of the elements of the substrate supporting mechanism as set forth in claim 1. It also is further submitted that Mears also does not teach, suggest nor offer any motivation for modifying the apparatus disclosed therein so as to yield the substrate supporting mechanism as set forth in claim 1.

Although each of claims 3-8 and 13-16 are considered allowable because of their dependency from a claim that is considered to be allowable, Applicant has made the following additional observations as to the patentability of certain of the dependent claims. As to claim 3, this claim adds the further limitation that the moving means causes the support members to move towards or away from the shaft member, the shaft member being the element that rotates to angularly displace the stage. As indicated above, in Mears, the finger members holding the wafer are moved radially inwardly and outwardly with respect to the wafer. Thus, it is not possible for Mears to disclose a moving means as is set forth in claim 3.

As to claim 5, this claim includes the further limitation that a plurality of moving means is provided to respectively connect with the plurality of support members to move the plurality of support members independently. Such a configuration is not disclosed, taught or suggested in Mears.

As to claims 13, this claim adds the further limitation that the moving means is configured and arranged so as to cause the support members to move in one direction with respect to a long axis of the support members. As to claim 14, this claim adds the

further limitation that the moving means is configured and arranged so as to cause the support members to move in a direction generally perpendicular to a long axis of the support members.

As indicated above, in Mears each of the finger members holding the wafer move radially inwardly and outwardly with respect to the wafer to respectfully grasp and release the wafer. Thus, the fingers or finger members in Mears cannot move in one direction with respect to the long axis of the support members because in all cases they are moving essentially in a plane and in different directions.

As to claim 15, this claim adds the further limitation that the moving means is configured and arranged so as to cause the support members to move in a direction generally perpendicular to the substrate end surface. Such movement is not possible in Mears, because of the radial inwardly and outwardly motion of the finger members disclosed in Mears.

As to claim 16, this claim adds the further limitation that the moving means is configured and arranged so as to cause each of the support members to rotate about a long axis of each support member. None of the finger members in Mears rotates about themselves nor is such a motion possible with the finger member structure disclosed and taught in Mears.

Applicant respectfully submits that absent the teachings of the subject application, there is no motivation in Mears to modify the apparatus disclosed in Mears so as to yield the substrate supporting mechanism claimed by Applicant. Applicant would further note that any such modification to the apparatus disclosed in Mears so

as to yield the mechanism claimed by Applicant also would necessarily involve destroying the intended operation of the apparatus disclosed in Mears.

It is respectfully submitted that claims 1, 3-8 and 13-16 are patentable over the cited reference for the foregoing reasons.

CLAIM 2

As indicated previously, Applicant rewrote claim 2 in independent form so that it included the limitations of then pending claim 1. Thus, claim 2 claims a mechanism for supporting a substrate including *inter alia* a moving means for moving the support members, where the moving means causes the support members to move in parallel in one direction of three dimensions on the stage or causes the support members to rotationally move on the stage. As noted above, the fingers or members of Mears are moved inwardly or outwardly radially with respect to the wafer. Thus, Mears *cannot* disclose, teach, or suggested rotationally moving the support members of the stage. Such motion is physically impossible for the finger members disclosed in Mears. As indicated above in the discussion regarding claims 3 and 15, Mears also cannot disclose the manner in which the support members are moved in the one direction of three dimensions, because of such radial inwardly and outwardly motion with respect to the wafer disclosed in Mears.

It is respectfully submitted that claim 2 is patentable over the cited reference for the foregoing reasons.

The following additional remarks shall apply to each of the above.

As provided in MPEP-2131, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Or stated another way, "The identical invention must be shown in as complete detail as is contained in the ... claims. *Richardson v Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ 2d. 1913, 1920 (Fed. Cir. 1989). Although identify of terminology is not required, the elements must be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990). It is clear from the foregoing remarks that the above identified claims are not anticipated by Mears.

As the Federal circuit has stated, "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor. *Para-Ordnance Mfg. v. SGS Importers Int'l, Inc.*, 73 F.2d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995). As indicated above, Mears does not suggest the desirability of the modification to the apparatus disclosed therein so as to yield the supporting mechanism and methodology claimed on Applicant.

As provided in MPEP 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In*

re Fine, 837 F. 2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F. 2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). As provided above, Mears includes no such teaching, suggestion or motivation.

Also, and as provided in MPEP 2143.02, a prior art reference can be combined or modified to reject claims as obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Additionally, it also has been held that if the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. Further, and as provided in MPEP-2143, the teaching or suggestion to make the claimed combination and the reasonable suggestion of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). As can be seen from the forgoing discussion regarding the disclosure and teachings in Mears, there is no reasonable expectation of success provided in Mears that if the finger members in Mears were modified as taught by Applicant they would be reasonably successful in overcoming the problem described by Applicant. Also, it is clear from the foregoing discussion that the modification essentially required to the apparatus disclosed in Mears so as to yield the invention claimed by Applicant, would change the principle of operation of the apparatus disclosed in Mears.

As provided by the Federal circuit, a 35 U.S.C. §103 rejection based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in a reference, is not proper and the *prima facie* case of obviousness cannot

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be properly made. In short there would be no technological motivation for engaging in the modification or change. To the contrary, there would be a disincentive. *In re Gordon*, 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case it is clear that if the apparatus in Mears was modified so as to yield the invention claimed by Applicant, such a modification would destroy the intent, purpose or function of the device as taught by Mears.

It is respectfully submitted that for the foregoing reasons, claims 1-8 and 13-16 are patentable over the cited reference and, therefore, satisfy the requirements of either of 35 U.S.C. §102 or 35 U.S.C. §103. As such, these claims are allowable.

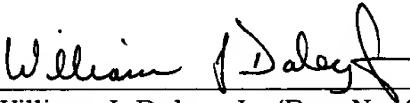
It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

Applicant believes that additional fees are not required for consideration of the within Response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

Date: November 13, 2002

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DETAILS OF AMENDMENTS

Please amend the subject application as follows:

IN THE CLAIMS

Amend claim 1 to read as follows:

1. (TWICE AMENDED) A mechanism for supporting a substrate to be coated with the film, which mechanism is used in a film forming apparatus, comprising:
 - a stage for receiving a substrate which has been transported into the film forming apparatus to form a film on the substrate;
 - a shaft member for angularly displacing the stage, that is bearing the substrate, from a substrate receiving position at which the stage received the substrate, to a film forming position at which a substrate bearing surface of the stage is vertical or substantially vertical;
 - a plurality of support members which are provided so as to protrude from the substrate bearing surface of the stage, ~~for supporting an~~ and so as to support one end surface of the substrate, where said one end surface is the surface which faces downwards; when the stage is angularly displaced to the film forming position; and
 - moving means for moving the support members.

Add new claim(s) 17 that read(s) as follows:

17. (ADDED) A mechanism for supporting a substrate to be coated with the film, which mechanism is used in a film forming apparatus, comprising:

a stage for receiving a substrate which has been transported into the film forming apparatus to form a film on the substrate;

a shaft member for angularly displacing the stage, that is bearing the substrate, from a substrate receiving position at which the stage received the substrate, to a film forming position at which a substrate bearing surface of the stage is vertical or substantially vertical;

a plurality of support members which are provided so as to protrude from the substrate bearing surface of the stage and to support an end surface of the substrate, which faces downwards when the stage is angularly displaced to the film forming position;

moving means for moving the support members; and

wherein the moving means is configured and arranged so as to cause the support members to one of:

(a) move in one direction with respect to a long axis of the support members,

(b) move in a direction generally perpendicular to a long axis of the support members,

(c) move in a direction generally perpendicular to the substrate end surface, or

(d) rotate about a long axis of each support member.